



# XSICEL 2021

Transición energética en la 4ta revolución industrial



Universidad  
Tecnológica  
de Pereira



UNIVERSIDAD  
**NACIONAL**  
DE COLOMBIA

# Implementation of an Energy Management System in Colombian Manufacturing – A Methodological Approach

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# I. Introduction

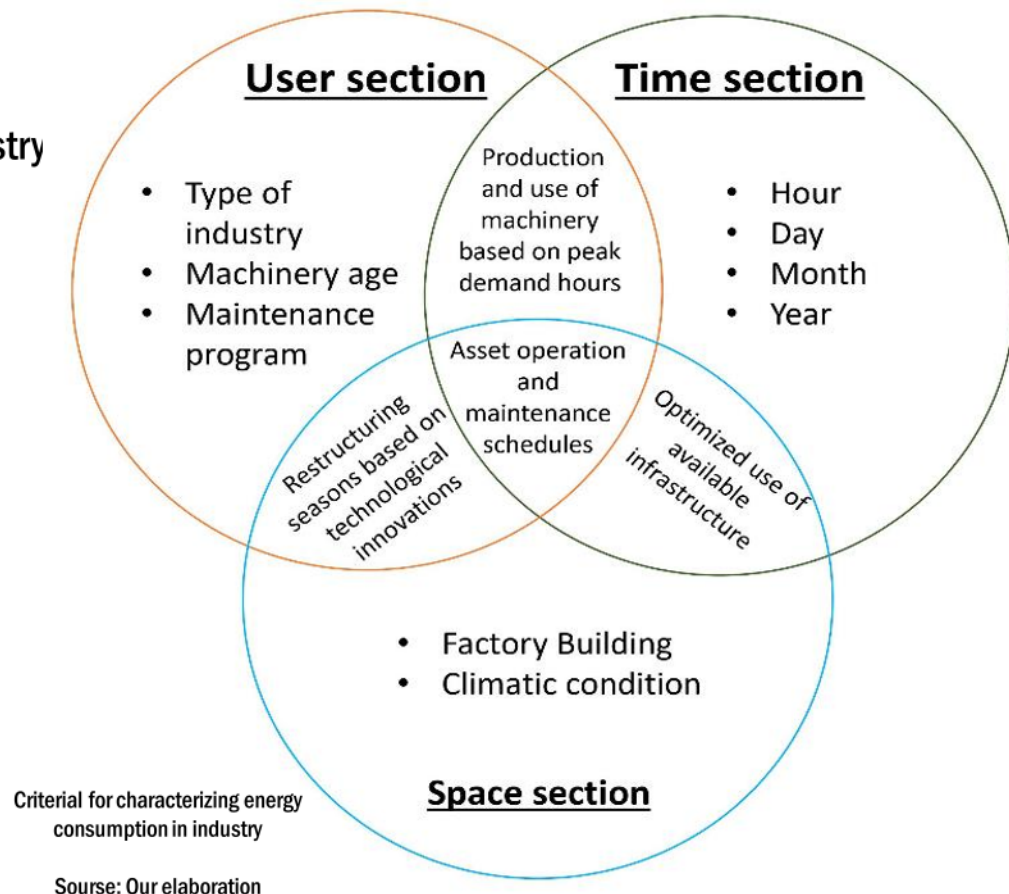
How to implement mechanisms for industry 4.0 models?

- Remove greenhouse gases from the environment
- High energy consumption worldwide
- Consuming patterns
- Energy efficiency and operational efficiency
- Mining as a component of economic influence

## II. Background

### Opportunities in the implementation of Industry 4.0 technologies

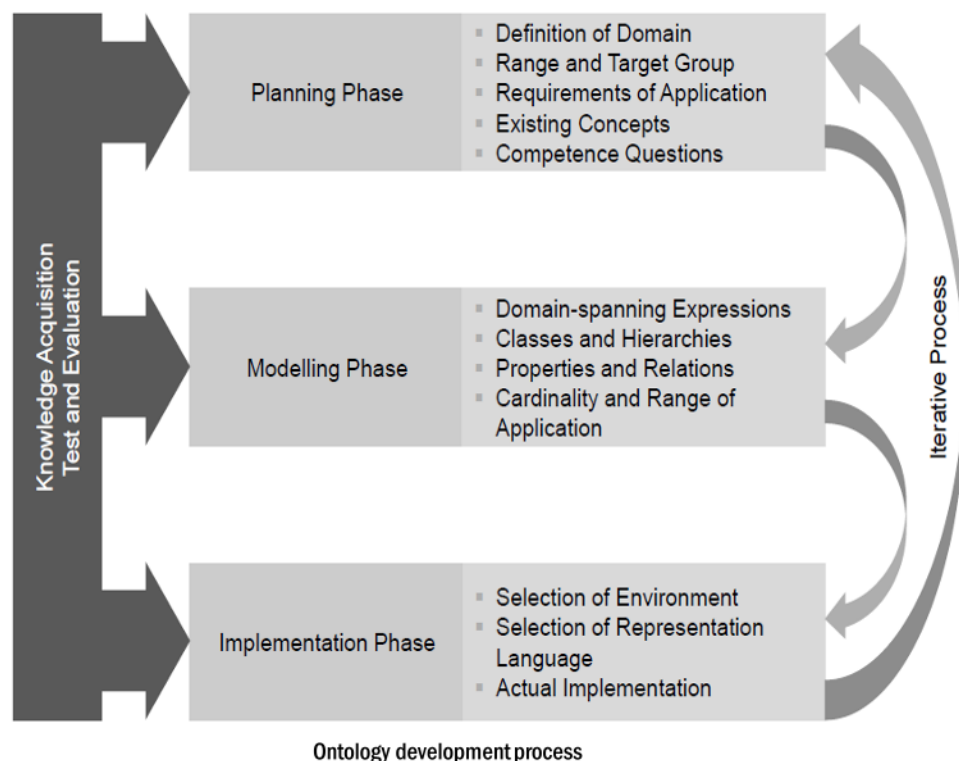
- AMI
- IoT, Big Data, Machine Learning
- Smart industries
- Mixed working model
- Characterization of energy demand
- Help for KPI calculation



# III. Proposed methodology

## Ontologies as a study proposal

- Explicit description of concepts in the industrial sector in this case
- Planning, modeling and implementation
- Identify sources of information and availability of databases
- Technological implementation capacity



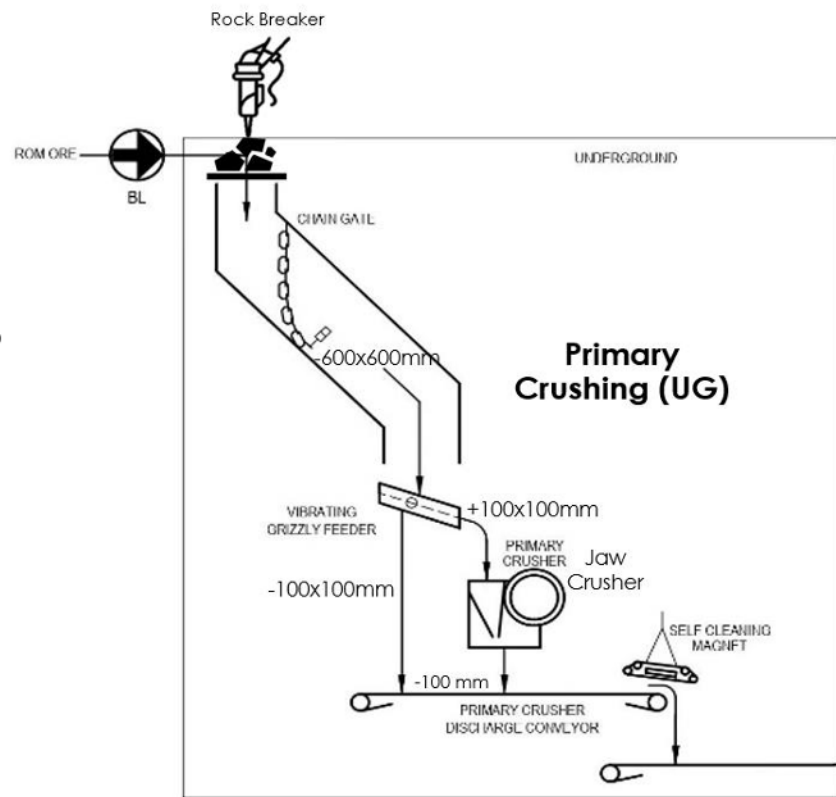
Ontology development process

Source: Semantic Meta Model for the  
Description of Resource and Energy Data in  
the Energy Data Management Cycle

## IV. Case study

### High energy consumption in the mining sector

- Energy consumption by the mining sector represents 25% of the total consumed by unregulated users
- Adaptive models with energy efficiency
- High energy consumption such as the shredding line
- Relationship between sensors, meters and motor machinery
- Optimal processes for energy efficiency



Modules of a shredding production line

Source: aimixtrituradora.com



## V. Partial conclusions

- New challenges in the field of data analytics
- It is possible to reduce the electricity consumption used to ontologies that allow approaching between multiple intelligent systems
- The production models may or may not be similar in terms of the type of machinery used to be analyzed from the ontologies
- It is possible to incorporate data on energy consumed in a productive context with EnMS and ontologies



# VI. Questions